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Marc Douez

David McGrath

COX-VOX™ SYSTEM

INSTALLATION, MAINTENANCE AND TROUBLESHOOTING GUIDE

Nielsen-Kellerman

COX-VOX OPERATION

On/Off

To use your Cox-Vox, simply place the unit in the cup bracket and plug it into the wiring harness. Be sure to align the plug and receptacle properly! There is an arrow molded into the rubber for help visually aligning the parts. The P5 can be damaged because of frequent improper alignment.

The large knob turns the unit on and off, and controls the volume. Twist the knob clockwise to turn the Cox-Vox on. Find an appropriate volume so that everyone in the crew can hear the coxswain. Adjusting the speakers slightly may help with this. Keep the volume as low as possible to prolong the battery life.

Airline Travel

With increased airport security, traveling with your Cox-Vox is trickier than ever. We recommend you check the Cox-Vox in with your luggage. Include product literature that explains what the Cox-Vox is. Brochures can be obtained from NK, or product literature can be printed from the website.

You certainly do **not** want to try to carry them onto an airplane. Cox-Voxes have been thrown into bomb chutes, even before 9/11.

If any of these functions do not work properly, review each step of the installation, checking all distances and alignments. Also review the "Troubleshooting" section for help pinpointing the problem.

If you still are having problems, please contact our Repair Department on 02-6258 9380 or write to info@nk.com.au

This new NK Gear Bag is a great replacement for your old black Cox-Vox Carry Case.

It features multiple compartments with adjustable dividers that can easily swallow up a Cox-Vox, mic, charger, SpeedCoach, Maintenance Kit, tools and more.

Water-resistant construction and sturdy padding throughout will keep all your gear protected, and a padded shoulder strap lets you load the bag up and still carry everything hands-free.

Available NOW. Part #0117

WARRANTY

Warranty Issues - NK products are carefully manufactured with high quality materials and thoroughly tested before shipping. We do not believe in "disposable electronics". Accordingly, all of our products are covered by a conditional warranty* for the first two years and a "customer care" policy thereafter.
- During the first two years, products with a warranty issue will be repaired or replaced at no charge (including return shipping within Australia) to the customer.
- During the third year & subsequent years, we will replace a failed unit with a unit at the "customer care price" shown on the chart below, plus shipping OR, if possible, we will repair the unit. We reserve the right to restrict this offer.

CUSTOMER CARE

NK wants you to be a customer for life, so we take care of you even beyond the terms of your product's warranty. We offer you a quick & economical service for the repair of your NK rowing equipment.

COX Vox overhaul:	$195.00 inc GST
COX VOX overhaul:	$165.00 inc GST

This is not just a simple repair, it is a major overhaul of your unit. Typically, this unit will function perfectly for the next 5 to 8 years (provided you follow our guidelines for care of the unit). Replaced items include: ALL seals, battery, panel rubber connector, all GOLD pins on connector, panel BNC, upgrade charge circuit, upgrade LCD lamp, supply silicone lubricant. Any further items that require repair are subject to the Customer Care Pricing chart. All repairs have a ONE YEAR warranty. Optionally, we can replace the can with a STAINLESS STEEL one for increased durability ($50.00 inc GST). Should your Aluminium can be excessively dented, then we must replace it with a stainless steel unit as above. We can also repair your crackling microphone ($38.50 inc GST). Should your unit not be economical repair, then we can offer you a NEW unit, with a TWO YEAR warranty at our customer care price. That is, you send us your old unit & we sell you a new unit at approximately half price (see below for exact prices). No ifs, no butts, that is a brand new unit. We do ask that the unit that you are sending to us has a valid serial number and must not have been repaired or attempted to be repaired by anyone other than us. This offer excludes products that have been physically abused. Customer must pay freight to have the unit delivered.

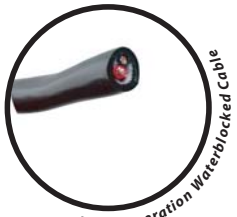
Customer Care Pricing Chart (all prices include GST)

SpeedCoach Gold control unit only	$349.30
SpeedCoach Red control unit only	$279.30
StrokeCoach unit control only	$169.00
CoxVox control unit only	$call
CoxVox control unit only	$call
Interval Rate Watch	$165.00

* Customer Care policy is valid only for components listed above for as long as we manufacture them and does not cover product upgrades. All other parts and accessories are covered under warranty up to one year from date of purchase.
HD harness has a 3 year warranty.
Units purchased prior to 1st January 2004 are covered by a one year warranty.
Warranty covers defects in materials & workmanship. Excludes damage due to improper use or neglect (including corrosion), modifications or attempted repairs by someone other than NK, impact damage, failed batteries & normal wear & tear.
Units must have been purchased in Australia from an authorised Nielsen Kellerman agent.
Except as otherwise provided herein, no other warranties, expressed or implied, are made with respect to these products, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose. NK assumes no liability for any damages, losses or expenses resulting directly or indirectly from product use.
All prices & services offered are subject to change.
Details are correct as at 1st Sept 2007

Cox-Box HD Wiring

3 Year Warranty


New Generation Waterblocked Cable

NEW! HD Wiring Harnesses from NK

NK wiring harnesses for the Cox-Box and Cox-Vox have over 25 years of proven performance on the water, and reflect our hard-won knowledge about how to make products that work in this demanding environment. Now we're taking our harnesses to the next level with new HD Wiring Harnesses. We're so sure these harnesses will give you trouble-free service that we're marking every one with the month and year of manufacture, and providing a full end-to-end THREE-YEAR WARRANTY. Our goal is to make our wiring like the wiring in your home - a reliable and invisible component that requires no thought from you after it's installed.

Custom R5 Protective Housing

Marine-Grade Waterblocked Cable

One of the most important components of the new harness is the wire itself: "New Generation Waterblocked Cable". This marine-grade cable carries two insulated wires inside a second water-blocking jacket that is extremely durable, and resistant to nicking and UV-damage. The wire itself is fully tinned, making it even more resistant to corrosion and simplifying repairs. We even custom order our wire in a black jacket to better match the interior of most shells.

Reinforced Speaker Plug

Custom R5 Protective Housing

Any boatman will tell you -- the R5 connector end of the harness takes the most abuse. Yanked, pulled and twisted every practice, it stands up to a lot. We have designed a custom-molded plastic housing that provides protection and strain relief for the wires where they enter the R5 connector. Each wire is sealed to its pin with melt-wall heat shrink. The R5 Housing is removable for replacement of the seat sensor should that ever prove necessary.

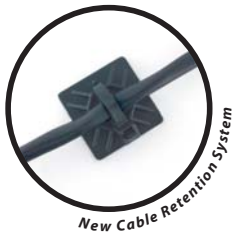
Solid Gold-Plated Pins & Sockets

The P5, R5, P2 and R2 connectors NK uses are some of the most reliable waterproof connectors around. When NK first started building wiring systems, we learned that the manufacturer's stock pins and sockets could not take the abuse of the rowing environment - they are made from hollow lightweight pressed metal and allow water to wick directly into the inside of the cable when not connected. Instead, NK pins and sockets are custom-machined just for us from SOLID Type 316 stainless steel, then plated with GOLD for even more corrosion-resistance and reliable connectivity. These pins and sockets cost over ten times more than stock pins and sockets, but we know from experience that they're worth it. With our harness, there is no need for a protective end cap, as we use waterproof connectors.

Slim Speaker Breakouts Reinforcement

Speaker Plug Reinforcement and Breakout Protection

At the speaker end, the wires are again sealed to our custom pins and sockets with melt-wall heat shrink. Metal clamps further reinforce the connection of the wires to the R2 connectors ensuring no leakage or pullout. We've also designed a custom housing to protect the location where the speakers are broken out from the main wire. This housing was kept a slim 19mm wide, making it easy to slide wiring and breakouts through deck holes when installing. Each breakout is further sealed with non-corroding sealant, ensuring no water can reach the wire connections inside.


New Cable Retention System

Improved Cable Retention System

To ensure tidy, long-lasting installations in any shell (even new shells with sealed bulkheads), we now supply 25mm square cable tie mounts with extra-strength foam supported acrylic adhesive. These cable tie mounts give you the option of securing more than one cable, or loops of cable, with a single wire tie. Subsequent adjustments are easy - just clip and replace the wire ties and the base mounts stay securely in place.

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CARING FOR YOUR COX-VOX SYSTEM

Nielsen-Kellerman equipment is designed, built and tested to withstand the rigors of everyday use, but it is **not** invincible and it can be damaged. The following information is intended to help you maintain your equipment and prevent unnecessary repairs.

Charging

- Place the unit on charge whenever it is not in use, but do not leave the unit charging indefinitely. The unit should never be charged continuously for longer than 2 days.
- If the battery light comes on, be sure to charge the unit for at least 12 hours.
- Do not continue to use a unit with the low battery warning light illuminated. Repeated use with the low battery light on may damage the batteries and unit.
- Under normal conditions, a fully charged battery should last at least 4 hours. If your unit is not providing this much operational time, it may be time to return it to NK to have new batteries installed. We expect our batteries to need replacement after three years of normal full-season use.

Care of Your Microphone

Your microphone is shipped attached to a headband and ready for use. The microphone is fully waterproof, and may be fully immersed, but it will not float on its own. Unless it is attached to a Cox-Vox, the microphone will sink. Microphones should be treated with care.

- Do not attempt to bend the aluminum boom or twist the mouthpiece.
- Do not drop the microphone.
- Do not yank or pull on the microphone cable when disconnecting from the Cox-Vox.
- Do not tighten the bayonet connector on the microphone to the panel jack on the Cox-Vox. Just slip it into place.
- Do not carry the Cox-Vox by the microphone.

Often, when a customer attempts to replace a microphone BNC, the replacement connector pin is of an incorrect diameter and damages the center conductor of the Cox-Vox panel mount BNC.

NOTE: The NK warranty covers defects in materials and workmanship. It DOES NOT cover damage caused by abuse, misuse, or attempts to repair the microphone on your own.

Additional Information

Never attempt to repair the Cox-Vox unit yourself. The units are specially sealed to make them watertight. Breaking this seal often causes very expensive damage and will void the warranty. The only accessory that we will repair is the microphone. We do encourage and will support experienced individuals to repair and maintain wiring harnesses and speakers.

REGULAR MAINTENANCE SCHEDULE AND TIPS

Daily Maintenance

1. If you row on salt water, rinse the Cox-Vox off with fresh water and dry it after every use.
2. Charge the unit whenever it is not in use, but do not leave the unit on charge indefinitely. The unit should not be charged for longer than 2 days straight.
3. Slip the metal microphone bayonet on the Cox-Vox panel jack without twisting to lock it. Do not tighten it fully.
4. Inspect the toggle-switch seal for integrity. This is especially important if you row in salt water and wash your unit regularly.

Once a Month

This maintenance is easy to perform with a Cox-Vox Maintenance Kit, available from NK.

1. Wash the Cox-Vox display panel with warm water and mild soap. Rinse well and dry.
2. Use the drill bit from the Cox-Vox Maintenance kit to clean out the metal sockets inside the rubber plug on the unit. Rotate the bit inside the sockets to dislodge any dirt or debris.
3. Check the inside of the rubber plug on the wiring harness for any dirt. Inspect the wires leading to the plug for any nicks or cuts. If these exist, contact NK about repairing them.
4. Apply silicone grease to the outside of the rubber plug on the Cox-Vox. This helps to minimize the damage done by repeatedly removing the unit from the boat. Try not to get silicone into the plug itself.
5. Microphone BNC and Panel BNC Connector: You can **greatly** reduce microphone static with regular maintenance of these connectors. Use the provided small screwdriver to gently spread the contact fins in the center of the mic BNC. The Socket Maintenance kit includes instructions and photos of this step. Use the syringe to run a generous bead of Nyogel on the inside diameter of the BNC connector on the Cox-Vox panel. This grease will transfer to the mic BNC when it is next connected.
6. Inject a small amount of electrical contact grease (Nyogel) into the sockets on the rubber Cox-Vox plug. Connect the unit to the harness. This will coat the pins with Nyogel and push some Nyogel deeper into the sockets, protecting them as well.

End of the Season

1. Inspect the toggle switch seal. Perform this step before washing the unit.
2. Wash the Cox-Vox with fresh water and dry it carefully.
3. Repeat the cleaning and lubricating steps under "Once a Month" maintenance.
4. Fully charge the Cox-Vox then unplug it and store it in a cool, dry place.

New from Nielsen-Kellerman: the Coxswain's Kit. Everything the prepared coxswain needs for practice. Kit Includes: Custom Pack with pouch and external CoxVox holder, one adjustable wrench, one 7/16" wrench, one 10mm wrench, athletic tape, electrical tape, Blister Medic first aid kit, 2 Carabineers, a tube of waterproof sun block and lip balm. ***NK PART 4050***

With the growing use of licence free, 2-way radios, NK have made available a special connector that allows a 2-way radio system to be used through an existing NK Cox-Vox or Cox-Vox system. The radio to microphone 'T' piece connector fits on the BNC microphone input of the amp unit. One end connects to a 2-way radio, the other is used to connect the existing microphone. The coach (with another 2-way radio) can then communicate to the crew discreetly. With multi-channels available, it is possible for the coach to speak to a number of crews at once or by switching channels, to just one crew individually.

Charge your Cox-Vox from any car or truck cigarette lighter. Great when traveling to regattas! ***CAR CHARGER – NK PART 0234 –***

SILICONE GREASE – NK PART 0241 –Silicone is the proper grease for lubricating all rubber plugs and receptacles in your Cox-Vox system. This grease will ensure that the plugs will connect and disconnect easily and will not swell or crack. Note: please do NOT use petroleum jelly or other lubricants that may cause the rubber to wear prematurely.

SOCKET MAINTENANCE KIT – NK PART 0242 – NK developed this kit to make it easy for you to care for the metal connectors inside your Cox-Vox P5 connector as well as the P2 connectors on the NK speakers. The kit includes a specially sized drill bit for cleaning corrosion and dirt from inside the sockets, as well as a syringe loaded with Nyogel for injecting into the sockets. Regular use of these tools will ensure long life and reliable performance of the connectors. One kit will allow you to maintain numerous Cox-Voxes for at least a season.

Cox-Vox Maintenance

If you row, cox or coach a coxed boat, you know the CoxVox is an important part of every practice or race. Though designed to perform in conditions that would destroy most electronics in minutes, there are a few things you can do to help your CoxVox last longer and perform better. For every waterproof electronic product, the connections are the potential trouble spots. NK sells a complete Cox-Vox Maintenance Kit with everything needed to make it easy to maintain the connections on your equipment. Follow these steps to keep your Cox-Vox, Cox-Vox, Microphones & Wiring static-free and reliable for years.

Cox-Vox Panel Connectors -

MONTHLY WASH the Cox-Vox panel with warm water and mild soap. RINSE well. DRY thoroughly

ROTATE DRILL BIT inside metal sockets of rubber P5 connector to dislodge dirt and corrosion and lift debris out of sockets.

APPLY ELECTRICAL CONTACT GREASE from syringe inside metal sockets. Avoid over filling sockets or getting into rubber.

APPLY GREASE from syringe inside metal BNC connector in a small bead between white conductor and metal can.

USE FOAM SWAB to apply SILICONE from small plastic

OUTSIDE OF P5 until a visible film of SILICONE covers surface. (Keep foam swab in provided bag for future use.)

INSPECT rubber boot around toggle switch for tears or damage. RETURN to NK if any visible damage.

Microphone - MONTHLY or As Needed

GENTLY SPREAD GROUND CONDUCTOR "FINS" of the microphone BNC away from the center white insulator using the small screwdriver. A slight gap between the fins and insulators should remain. Slip the BNC onto the greased Cox-Vox panel BNC to transfer grease into the body of the microphone BNC. INSPECT cable for intact heat shrink and connection to BNC. Return to NK for repair if there is visible damage.

REMEMBER! DO NOT lock the BNC ring when plugging in to the Cox-Vox. DO NOT carry the Cox-Vox by the microphone. DO NOT bend the microphone boom, twist the mouthpiece or twist or yank the cable.

Speaker/Harness Connectors - TWICE A YEAR (End of Season)

ROTATE DRILL BIT inside metal sockets of rubber P2 connectors to dislodge dirt and corrosion and lift debris out of sockets.

APPLY ELECTRICAL CONTACT GREASE from syringe inside P2 metal sockets. Avoid over filling sockets or getting onto rubber.

USE FOAM SWAB to apply SILICONE to outside of P2 connectors. Reconnect all P2/R2 connectors firmly.

Tips to Help You Get the Most From Your Cox-Vox

· Make sure that the CoxVox is carried by the handle, and NEVER by the microphone. After use, detach the microphone, and do not store the unit with the mic attached. When attaching the mic to the CoxVox unit, avoid twisting the BNC connection down until it locks. Instead, connect the mic, and twist the socket just enough to keep it attached.
· Keep your CoxVox clean by rinsing it off after use, ESPECIALLY if you row in salt water.
· Store your CoxVox in a cool, dry place. Avoid leaving it in severe heat or cold (such as the dashboard of a car or an unheated boathouse in the winter) which can greatly shorten the life of the rechargeable battery pack.

CHARGING

· Recharging: Recharge a regularly-used CoxVox whenever possible to ensure that it will have enough power for the next practice. A fully drained CoxVox battery pack requires 12 hours on charge to attain maximum capacity. **At the end of the season, charge the unit for 12 hours, disconnect the microphone and charger, and store in a cool dry place until ready to use next season.**
· Memory Effect: It is not necessary to try to discharge the CoxVox batteries fully between charging - there is virtually no memory effect in modern nickel cadmium batteries.
· Avoid Overcharging: NK chargers are current-limiting and help prevent battery damage from overcharging. However, leaving the unit plugged in for many days or weeks (past full charge) may still cause damage. So PLEASE be sure to unplug and store your units during your off season breaks.

BATTERY LIFE

The life of your battery depends upon many things: the age of the battery pack, the volume and talkativeness of the coxswain, and the extent of charge. Here are some performance guidelines that should help you plan your CoxVox use.
· A fully charged battery will power a CoxVox with NO audio (volume turned all the way down) for 16 hours.
· With the volume turned all the way up, the battery can supply power for 50 minutes of continuous talk.
· Therefore, with an average volume setting and a coxswain talking less than half the time, a fully-charged CoxVox will provide at least two to three hours of power, and usually more.
· Having the Coxswain turn the volume down as low as possible will help prolong the battery life.
· If your CoxVox unit is more than three years old, the battery performance will decrease. Simply return the unit to NK for a new battery replacement. If you're not sure how old your unit is, give the Service Department at NK a call and they can research your unit's serial number to tell you when it was last serviced.

Visit www.nk.com.au for more maintenance and troubleshooting tips, or contact NK email support on info@nk.com.au

Battery Life

The life of your battery depends upon many things: the age of the battery pack, the volume and used by the coxswain and the extent of charge. Here are some performance guidelines that should help you plan your Cox-Vox use.

- A fully charged battery will power a Cox-Vox with NO audio (volume turned all the way down) for 16 hours.
- With the volume turned all the way up, the battery can supply power for 50 minutes of continuous talk.
- Therefore, with an average volume setting and a coxswain talking less than half the time, a fully charged Cox-Vox will provide at least two to three hours of power, and usually more.
- Having the Coxswain turn the volume down as low as possible will help prolong the battery life.
- A fully drained Cox-Vox battery requires 12 hours on charge to attain maximum capacity.
- It is not necessary to try to discharge the Cox-Vox batteries fully between charging — there is virtually no memory effect in modern nickel cadmium batteries.
- If your Cox-Vox unit is more than three years old, the battery performance will decrease. Simply return the unit to NK for a new battery replacement. If you would like to determine the age and/or repair history of a unit, please send an e-mail to info@nk.com.au

Avoid overcharging your Cox-Vox. NK chargers are current-limiting and help prevent battery damage from overcharging. However, leaving the unit plugged in for many days or weeks (past full charge) may still cause damage. Please be sure to unplug and store your units during your off season breaks.

TROUBLESHOOTING

A Cox-Vox system consists of four major components: the Cox-Vox unit, the microphone, the wiring and the speakers. All of these components must function for your system to work properly. If you are having a problem with your system, the best diagnostic tool is to swap out each component, one at a time, with a working component. When the problem disappears, you know you have pinpointed the trouble area.

Cox-Vox Will Not Take or Hold a Charge

—Is the Cox-Vox being charged correctly?

Review the "Charging" section under Maintenance above and confirm that proper procedures are being observed when charging the Cox-Vox.

—Is the correct charger being used?

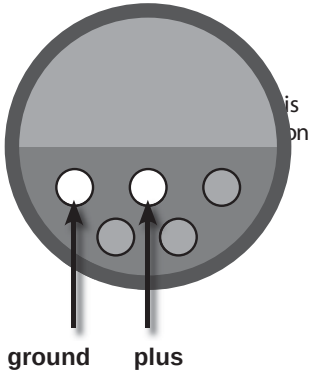
Our chargers are rated 12VDC and 300mA and are sent to the user with a special plug attached. We recommend that all chargers be purchased from NK, and that you do not modify a charger purchased elsewhere for use with a Cox-Vox.

—Is the charger working?

- Is the red LED illuminated when the charger is plugged in?
- Is the charger warm? A normal charger will be very warm after less than one hour's operation. If the charger is not warm then it is not operating correctly. However, chargers can be warm, but **not** work properly.

• Does the unit charge with a different charger? If so, then the first charger is bad. If you suspect that your charger is not working correctly you can perform the following test:

Obtain a multimeter—almost any type will do. Turn the multimeter on and set it at 20 VDC. After plugging the charger in (be VERY careful, the charger ON!), place the positive lead from the multimeter the plus pin, and the negative lead from the multimeter onto the ground pin. The multimeter should read between 13.5V -15V. Any deviation from this range indicates that the charger is not working. If you do not get any voltage reading on the multi-meter, the internal transformer is damaged the charger must be replaced.



NOTE: NK NO LONGER REPAIRS CHARGERS!

If you wish to repair a charger plug, you may obtain pins and instructions from NK. However, for most people, the most cost- and time-effective approach is simply replacement.

—Have the batteries exceeded their lifespan?

A Cox-Vox Battery is expected to provide 3 years of normal use (daily practices for approximately six to nine months of the year). If you know your unit's batteries are older than three years, we recommend that the unit be returned to NK for new batteries and servicing. We can often check our records to determine the age of your unit's batteries.

No Audio/Intermittent Audio/Static

—Is the wiring clean of cuts or nicks?

Cuts or nicks in the wiring are the most frequent causes of audio problems. Be sure that all of the connectors (pins, sockets, plugs, receptacles) are not damaged and are positioned properly.

—Is the microphone working properly?

The microphone may be the cause of failure. Test the system with a microphone you know is good. Note: A damaged microphone often causes static.

—Are the connectors (pins, sockets, plugs, receptacles) properly positioned?

See installation.

—Are the speakers working properly?

Be sure all of the speakers are plugged in properly and are in working order (replace one at a time with a known good speaker to test). If you are getting a loud squealing noise, try pointing the speakers away from the coxswain to minimize feedback.

INSTALLING YOUR SYSTEM

PLEASE, read through ALL of the installation instructions before beginning to install your system!

Check that you received everything required. If you purchased a complete CoxVox system you should have received the following items:

- Carrying bag ..... (1)
- CoxVox control unit ..... (1)
- microphone ..... (1)
- charger ..... (1)
- speakers ..... (as ordered 2 or 3)
- mounting cup ..... (1)
- harness ..... (1)
- "Do's & Don'ts" card ..... (1)
- hardware pack with magnet ..... (1)

NOTE: The double-sided "VHB" tape provided for mounting is epoxy based and requires 12 hours of cure time. Do not get this tape wet while curing for best results.

LAY OUT THE PARTS OF YOUR SYSTEM

Uncoil the wiring harness and lay it out in the shell. If you are installing your COX Vox in a sectional shell, the harness should be equipped with a plug/receptacle pair which should be within a foot of the sectional bulkheads.

INSTALL THE LOUDSPEAKERS

The NK loudspeakers are factory assembled and waterproofed using silicone-based protective coatings. Rain, fresh water, and salt water should not harm the speakers, but we strongly recommend that you install and angle the speakers so that any water which gets in can run out again. The plug-in feature of NK speakers makes replacement very easy.

1. Install the speakers using #6 x 1/2" panhead screws and the metal bracket (attached to the speaker). We have supplied SIX screws; you will not use all of them unless you are installing a three speaker system. Remember, it is best if the speakers are angled downward to let water run out.

2. Connect the speakers to the wiring harness. Use the remaining six cable clips to secure the wiring harness. We suggest you use the #6 x ½" brass screws supplied to fully secure these clips.

INSTALL THE MOUNTING CUP

Decide where you want to secure the cup and mark off the surface using the cup as a template. Drill two pilot holes for the #8 x ½" panhead screws and secure the cup. Do NOT over tighten the screws!